

## WEST Search History





DATE: Sunday, December 05, 2004

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		<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ</i>	
<input type="checkbox"/>	L41	threshold and l40	4
<input type="checkbox"/>	L40	20000512	11
<input type="checkbox"/>	L39	caching near5 ( nearest or close or closest or closer or nearer) near5 (user or client)	69
<input type="checkbox"/>	L38	l29 and (frequent or frequently)	5
<input type="checkbox"/>	L37	l29 and (user adj2 (profile or behavior))	0
<input type="checkbox"/>	L36	L34 and l30	0
<input type="checkbox"/>	L35	L34 and l29	0
<input type="checkbox"/>	L34	20000512	69
<input type="checkbox"/>	L33	(monitor or monitoring or monitored or watch or watching or watched or update or updating or updated ) near8 (session or behavior or behaviour or online) near8 (cache or caching or cached)	150
<input type="checkbox"/>	L32	l30 and l24	0
<input type="checkbox"/>	L31	l29 and l24	0
<input type="checkbox"/>	L30	20000512	288
<input type="checkbox"/>	L29	20000512	19
<input type="checkbox"/>	L28	(content near5 (caching or mirroring)).ti.	94
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<input type="checkbox"/>	L26	(update or updating) near8 (user adj2 (profile or behavior)) near8 (cache or caching) near8 content	0
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<input type="checkbox"/>	L24	20000512	30
<input type="checkbox"/>	L23	(monitor or monitoring or monitored or watch or watching or watched ) near8 (session or behavior or behaviour or online) near8 (cache or caching or cached)	51
<input type="checkbox"/>	L22	L15 and (user adj2 (profile or preference or behaviour or behavior))	3
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<input type="checkbox"/>	L20	L18 and L6	0
<input type="checkbox"/>	L19	L18 and L9	0
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<input type="checkbox"/>	L17	L16 not L9	33

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<input type="checkbox"/>	L11	L10 and l9	0
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<input type="checkbox"/>	L9	20000512	29
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<input type="checkbox"/>	L6	(user adj2 (profile or preference or behaviour or behavior)) near8 (update or updating or monitor or monitoring) near8 (cache or caching or cached)	13
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<input type="checkbox"/>	L3	(cache or caching) near8 content near8 (delivery or deliver) near8 (user adj2 (preference or profile))	3
<i>DB=USPT; PLUR=YES; OP=ADJ</i>			
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<input type="checkbox"/>	L1	6640284.pn.	1

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L5: Entry 1 of 6

File: PGPB

Jun 14, 2001

DOCUMENT-IDENTIFIER: US 20010003828 A1

TITLE: CLIENT-SIDE SYSTEM FOR SCHEDULING DELIVERY OF WEB CONTENT AND LOCALLY  
MANAGING THE WEB CONTENT

Application Filing Date:

19971028

Detail Description Paragraph:

[0084] The indexing subsystem 120 stores the user's preferences in a preference store 124 (which may be physically implemented in the cache 116 or other memory of the client computer). The browser 90 uses the user preferences to collect any additional Web content that is not locally stored in the cache 116. Additionally, the preferences are used to create filters that remove unwanted Web content before it is presented to the user.

CLAIMS:

34. A system as recited in claim 30, further comprising: a program implemented at the client to cache a user's preferences regarding types of Web content; and a filter to filter the index according to the user's preferences.

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L5: Entry 3 of 6

File: USPT

Jan 21, 2003

DOCUMENT-IDENTIFIER: US 6510458 B1

TITLE: Blocking saves to web browser cache based on content rating

Abstract Text (1):

A user sets preference parameters that filter web page contents from being stored in the cache. The preferences relate to the web page's contents and attributes. Before caching the web page, the contents and attributes of the web page are filtered solely as a function of the web browser. Cache filters take a variety of forms, such as ratings filters, web page identifier filters, and key word filters, which scan accessed contents of a web page for user selected terms. The filtered web page is then blocked from entry in the browser's cache based on the filtering process. Conversely, a user sets preference parameters that filter web page contents to override the block from cache preferences. The browser responds by storing the filtered web pages that were previously designated as web pages not to be cached.

Application Filing Date (1):

19990715

Brief Summary Text (16):

The present invention provides a method and system for filtering the content of a web page to be cached, solely as a function of the web browser. In the present invention, a user sets preference parameters that filter web page contents from being stored in the cache. Cache filters take a variety of forms, such as ratings filters, web page identifier filters, and key word filters, which scan accessed contents of a web page for user selected terms. The filtered web page is then blocked from the browser's cache. Conversely, a user sets preference parameters that filter web page contents to override the block from cache preferences and store the filtered web pages that were previously designated as web pages not to be cached.

Drawing Description Text (13):

FIG. 11 illustrates a flowchart depicting the process of setting user defined preferences for blocking web page contents from a browser-defined cache in accordance with a preferred embodiment of the present invention; and

Detailed Description Text (103):

However, in a preferred embodiment of the present invention, the content of a web page is filtered solely as a function of the web browser. In the present invention, a user sets preference parameters that filter web page contents from being stored in the cache. Cache filters may take a variety of forms, such as ratings filters, web page identifier filters, and key word filters, which scan accessed contents of a web page for user selected terms.

Detailed Description Text (104):

Conversely, in another preferred embodiment of the present invention, the user sets preference parameters which filter web page contents to override the block-from-cache preferences and to store the filtered web pages which were previously designated as web pages not to be cached. Preferred embodiments of the present

invention are now described with respect to FIGS. 11 and 12.

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L13: Entry 10 of 12

File: USPT

Apr 16, 2002

DOCUMENT-IDENTIFIER: US 6374404 B1

TITLE: Intelligent device having background caching of web pages from a digital television broadcast signal and method of same

Abstract Text (1):

A client-side intelligent device having background caching of web pages within a digital television (DTV) system and method of same. The present invention includes a digital television system having an intelligent device for interfacing with a user/viewer and controlling the display of information on a display screen. The intelligent device, in one embodiment, is a set-top-box, but could be any intelligent electronic device or computer system. The set-top-box is configured to receive a DTV signal (e.g., land based cable or digital satellite system) that includes audio/visual information as well as data signals in a datacast format. The datacast format includes web pages, e.g., in the HTML (hypertext markup language) format of the world wide web. The DTV broadcasters support multiple channels of information on which content providers can supply a domain of web pages on a periodic basis. The present invention is able to display viewer-selected web pages on the DTV system. An intelligent filter is used that modifies itself based on user behavior and user preferences in terms of the web pages that a viewer routinely visits. The intelligent filter is then used to identify certain web pages of the pages that are being broadcast and these identified web pages are stored in a cache memory for later use by the viewer. A second tuner can be used to poll multiple channels when updating the cached contents. Cached web pages avoid broadcast latencies (due to periodic updating) and thereby are displayed faster to the viewer.

Application Filing Date (1):

19981216

Brief Summary Text (12):

The DTV broadcasters support multiple channels of information on which digital content providers can supply a domain of web pages that are transmitted in round robin fashion on a periodic basis. The present invention is able to display viewer-selected hypertext documents on the DTV system from this domain. An intelligent filter is used to cache hypertext documents. The intelligent filter modifies itself based on user behavior, e.g., user history, and user preferences in terms of the web pages that a viewer routinely visits. The intelligent filter is used to identify certain web pages (or other HTML-based documents and multi-media components) of the data that are being broadcast and these identified web pages are stored in a cache memory for later use by the viewer. Hypertext documents are forward cached in that they are stored in the cache memory before they are displayed to the user. A second tuner can be used to poll multiple channels when updating the cached contents. Cached web pages avoid broadcast latencies (due to periodic updating) and thereby are displayed faster to the viewer. The use of cached web pages therefore enhances internet connectivity performance.

Detailed Description Text (14):

With respect to system 170a and system 170b, the network broadcasters 190 broadcast a domain of hypertext documents in a periodic fashion, as discussed above. The

number of documents within this domain. is limited only by available channel bandwidth and expected latency. The document broadcast order is arbitrary, and typically established by the content provider. For instance, a 19.2 Megabit/second channel totally dedicated to the transmission of datacast information could broadcast about 200 hypertext documents per second. If a particular content provider wanted to establish a maximum latency of 20 seconds for any hypertext document, then about 200.times.20 or 4,000 hypertext documents would be the maximum number of documents within the domain for that channel. The broadcast order of the hypertext documents would be arbitrary and could be such that frequently visited documents get broadcast more often (e.g., with more frequency) than other lesser requested documents. In this case, different hypertext documents would have different maximum latencies.

Detailed Description Text (32):

If a cache miss occurs at step 456, then process 450 flows to step 458. At step 458, if the DTV system of the present invention contains a digital modem, it can optionally be used to obtain the selected hypertext document from the internet. Within the preferred embodiment, the DTV system of the present invention, at step 458, uses the digital TV broadcast signal 150 to obtain the selected hypertext document. At this step, the DTV system monitors the digital TV broadcast signal 150 until its periodic broadcast transmits the selected hypertext document. At step 458, a latency can be detected by the viewer between the request and the display of the selected hypertext document. The duration of the latency depends on the maximum latency for hypertext documents as determined by the content provider of the currently tuned channel. The latency is also determined by the timing of step 458 within the periodic broadcast of hypertext documents. At step 460 and step 462, the selected hypertext document is located and it is stored within a memory unit of the intelligent device 112. At step 466, the selected hypertext document is then displayed on the digital screen. Process 450 then returns.

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File: USPT

Apr 4, 2000

[Preferences](#)[Logout](#)

DOCUMENT-IDENTIFIER: US 6047327 A

TITLE: System for distributing electronic information to a targeted group of users

Application Filing Date (1):19960216Brief Summary Text (12):

The system, according to the present invention, has the advantage of allowing information and content providers to take an active role in the distribution of information. Another advantage of the system is that it allows information providers to target particular audiences for receiving information and advertisement. This ability to "focus" the dissemination of information allows information providers and marketers to only send information to users who might be interested in that information, reducing excessive waste of bandwidth and transmission capability. Specifically, the system allows the division of a general audience into different segments of targeted audiences at a fine level of granularity based on the criteria used.

Detailed Description Text (3):

In FIG. 1, a communication system 1 containing the preferred embodiment of the invention is illustrated. Communication system 1 includes a network A 3, which in the preferred embodiment is a wide area network such as the internet. Network A 3 has a content provider A 5, a content provider B 7, a content provider C 9, and a content provide D 11 connected to it. Network A 3 also has a computer system A 13 and a computer system B 15 connected to it. Lastly, network A 3 has a server A 17 and a server B 19 connected to it.

Detailed Description Text (4):

Server A 17, which is termed an InfoCast server, is connected to a network B 21, which, in the preferred embodiment, is a cellular communication system. In addition, server A 17 is also connected to a content provider E 6, a content provider F 8, and a content provider G 10, as described below. Server A 17 is also connected to a client A 23 and a client B 25 through the use of network B 21. In addition, server A 17 is connected to a client C 29 and a client D 31 through a local area network 27. Similarly, server B 19, which is also an InfoCast server, is connected to a client E 35 and a client F 37 through a local area network 33.

Detailed Description Text (5):

In the preferred embodiment, content provider A 5 is a hyper-text transport protocol (HTTP) server that can provide a real-time news service to the various computer systems connected to network A 3 via hyper-text markup language (HTML) documents. Content provider B 7 is a file transfer protocol (FTP) server which allows clients to access files located on the server. Content provider C 9 is another HTTP server maintained by a business and configured to be able to process electronic transactions. Content provider D 11 is an HTTP server configured to provide advertising information via HTML documents.

Detailed Description Text (6):

Alternatively, content providers A 5, B 7, C 9 and D 11 can be servers offering



other types of information using different protocols. For instance, content provider A 5, instead of being an HTTP server configured for delivering news, can be a server for providing wide area information services (WAIS). Other types of servers that can be located on network A 3 in addition to the servers mentioned above can include Gopher servers, Archie servers, and other servers providing other multimedia data. Moreover, servers providing WWW "searching" services--i.e., servers that search WWW sites and retrieve information matching certain criteria from those WWW sites--and USENET search engines--i.e., servers that search USENET news groups--can also interface with an InfoCast server to provide a constant stream of new information.

Detailed Description Text (7):

Computer system A 13 and computer system B 15 represent a general class of computer systems including workstations, minicomputers and personal computers. These computer systems can access the various services provided by content provider A 5, B 7, C 9 and D 11. Alternatively, computer system A 13 and computer system B 15 can be any computing device equipped to access network A 3.

Detailed Description Text (8):

Content provider E 6 is a computer system that is connected to server A 17 through the use of a public switched telephone network. Content provider F 8 is a service providing a video/audio feed to server A 17 through the use of a satellite communications network. Content provider G 10 is a video/audio feed service that is directly connected to server A 17 through the use of a coaxial cable.

Detailed Description Text (16):

Server content database 51 contains data used by the InfoCast server in serving the users currently in its territory. Server content database 51 contains data received from sources such as content provider A 5, content provider B 7, content provider C 9, content provider D 11, content provider E 6, content provider F 8, and content provider G 10. Thus, server content database 51 would contain news and weather information from content provider A 5 and advertisements from content provider D 11. In addition, server content database 51 can contain such resources as the geographical location of all airports, train stations, and other transportation centers, in addition to other points of interest for which a user might wish to receive information. Server content database 51 is also used to contain content from other sources such as computer system A 13, computer system B 15, or even from the content database of server B 19, which has the same structure as server A 17. Moreover, server content database 51 is preferably used to contain resources that are often used to reduce accessing time but yet of a relatively small size to conserve space. Larger resources will not be contained in server content database 51 and will be accessed through the use of server resource database 55, as described below.

Detailed Description Text (21):

InfoFeed interface 57 is used to update server InfoBite database 50, server content database 51, subscriber database 53, and server resource database 55. In the preferred embodiment of the invention, content provider A 5, content provider B 7, content provider C 9 and content provider D 11 would use InfoFeed interface 57 to update the databases contained in server A 17 through the use of ODBC API 59. Access to InfoFeed interface 57 is obtained either through the use of network A 3; such as the case for content provider A 5, content provider B 7, content provider C 9 and content provider D 11; a modem bank, such as the case for content provider E 6; a satellite link, such as the case for content provider F 8; a direct connection, such as the case for content provider G 10; or any other communication infrastructure allowing the receiving and transmitting of data. Thus, in the preferred embodiment, InfoFeed interface 57 contains an interface for the internet, modems, satellite transceivers, and direct connections.

Detailed Description Text (22):

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L13: Entry 12 of 12

File: USPT

Nov 30, 1999

DOCUMENT-IDENTIFIER: US 5996007 A

TITLE: Method for providing selected content during waiting time of an internet session

Abstract Text (1):

Selected content such as product information and announcements is provided during waiting time of an Internet session. In one implementation, the process implemented by the waiting time message program of the invention involves monitoring (416) a user node to identify a web site access request, accessing (418) a previously stored message set, selecting (432) a message from the message set and displaying or playing back (434) the selected message. The message set and particular messages may be selected based on user information (e.g., demographic, psychographic, or product preference information), information regarding the expected waiting time or other information. Messages are thereby provided during waiting time that would otherwise be essentially wasted from the perspective of an ordinary Internet user, e.g., during processing time associated with the exchange of information between Internet content providers and Internet content users.

Application Filing Date (1):

19970616

Brief Summary Text (2):

The present invention relates in general to interactive communication networks such as the internet or other public or private networks (generically the "Internet") and, in particular, to providing selected content during interval and/or dead time ("waiting time") of an Internet session, e.g., during processing time associated with the exchange of information between the Internet content providers and Internet content users.

Detailed Description Text (14):

During an Internet session, the program monitors (416) the user node to identify a site access request. The site access request may be identified by reference to a header message of a protocol communication between the browser and the selected web site. Alternatively, the site access request may be identified by monitoring operating system messages or by identifying a URL entry via a keyboard. Upon identifying a site access request, the program accesses (418) the message set is stored, for example, on the user's hard drive or in cache. The program may select (432) a message from the message set based on user information, information regarding the expected duration of the waiting time, both, or neither. If user information is to be utilized (420) the program retrieves (422) a user profile. The user profile is preferably based on user information voluntarily entered by the user as described above. Alternatively, user information may be derived, for example, based on the selected web site, a history of selected web sites during the current Internet session and/or previous sessions or based on other information obtained by monitoring the user node. In addition, the program may identify (424) user participation parameters entered by the user as described above.

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L18: Entry 3 of 33

File: USPT

Aug 17, 2004

DOCUMENT-IDENTIFIER: US 6779039 B1

TITLE: System and method for routing message traffic using a cluster of routers sharing a single logical IP address distinct from unique IP addresses of the routers

Application Filing Date (1):  
20000331

Detailed Description Text (99):

The network flow controller 810 can direct traffic to Proxy Servers that cache the contents of frequently accessed web pages locally, improving response time to a web browser user and freeing expensive (WAN) network bandwidth for the network administrator. Proxy Server operation is both disk and CPU intensive, so that Proxy Servers are prime candidates for clustering. Effectiveness of a Proxy Server is proportional to usage. Users must configure the web browser to directly interact with the Proxy Servers rather than accessing a web-site directly. When the administrator cannot enforce a users voluntary use of Proxy Servers, network flow controller 810 can be used to transparently redirect HTTP traffic to a Proxy Server without the user configuring the web-browser. Redirection is applied to traffic originating from network-type ports, not server or router ports, and is destined for user-configured router IP addresses.

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L18: Entry 9 of 33

File: USPT

Apr 9, 2002

DOCUMENT-IDENTIFIER: US 6370571 B1

**\*\* See image for Certificate of Correction \*\***

TITLE: System and method for delivering high-performance online multimedia services

Abstract Text (1):

Disclosed is a scalable, hierarchical, distributed network architecture and processes for the delivery of high-performance, end-to-end online multimedia services, including Internet services such as World Wide Web access. The network architecture connects a high-speed private backbone to multiple network access points of the Internet, to a network operation center, to a back office system, and to multiple regional servers in regional data centers. Each of the regional servers connects to several caching servers in modified head-ends, which in turn connect via fiber optics to many neighborhood nodes. Finally, each node connects via coaxial cable to multiple end-user systems. The processes include those for replicating and caching frequently-accessed content, and multicasting content customized per region or locality.

Application Filing Date (1):

19970305

Brief Summary Text (13):

The present invention relates to a system and method for delivering high-performance online multimedia services, including Internet services such as WWW access, that satisfies the above-described needs. The system and method combine a scalable, hierarchical, distributed network architecture and processes for replicating and caching frequently-accessed multimedia content within the network, and multicasting content customized per region or locality.

Brief Summary Text (17):

Certain frequently-accessed information or content is cached within and replicated amongst the RDCs. This reduces traffic redundancy since an end-user's request for data that has been so replicated or cached may be fulfilled by the "nearest" (most closely coupled) RDC. In addition, the RDCs are able to multicast content that has been customized for the region to end-users in the region. This further reduces redundant traffic. Finally, the RDCs contain NMS clients that monitor and proactively manage network performance in the region so that traffic bottlenecks may be identified and overcome. The NMS detects and figures out the locations of the faults throughout the network, correlates failures, and can report faults to the appropriate repair entities, create trouble tickets, and dispatch repair crews.

Brief Summary Text (18):

Frequently-accessed content is also cached within the modified head-ends. This further reduces redundant traffic because an end-user's request for content that has been so cached may be fulfilled by the "nearest" modified head-end.

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L24: Entry 1 of 30

File: USPT

Aug 10, 2004

DOCUMENT-IDENTIFIER: US 6775695 B1

TITLE: Client session depth based caching in proxy servers

Abstract Text (1):

Methods and apparatus are provided for controlling document transfer between a web server coupled to a wide area network, such as the Internet, and a client coupled to the wide area network. The method includes the steps of monitoring the number of documents requested by a client in a current session, placing a document requested by the client in a file cache according to a caching algorithm that is based, at least in part, on the number of documents requested by the client in the current session, and accessing the document in the file cache when the document is requested subsequently by the client. The file cache may be associated with a proxy server that couples a local area network to the wide area network.

Application Filing Date (1):

19991029

Brief Summary Text (12):

In accordance with a first aspect of the invention, a method is provided for controlling document transfer in data communication apparatus for document transfer between a web server coupled to a wide area network and a client coupled to the wide area network. The method comprises the steps of monitoring the number of documents requested by a client in a current session, placing a document requested by the client in a file cache according to a caching algorithm that is based, at least in part, on the number of documents requested by the client in the current session, and accessing the document in the file cache when the document is requested subsequently by the client. The wide area network is typically the Internet.

Brief Summary Text (16):

According to another aspect of the invention, data communication apparatus is provided for coupling a local area network to a wide area network. The local area network interconnects a plurality of clients. The data communication apparatus comprises a file cache for storing documents requested by the clients from the wide area network, and a proxy server coupled between the local area network and the wide area network and coupled to the file cache. The proxy server comprises means for monitoring the number of documents requested by a client in a current session, means for placing a document requested by the client in the file cache according to a caching algorithm that is based, at least in part, on the number of documents requested by the client in the current session, and means for accessing the document in the file cache when the document is requested subsequently by one of the plurality of clients.

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L40: Entry 1 of 11

File: PGPB

Sep 12, 2002

DOCUMENT-IDENTIFIER: US 20020129116 A1

TITLE: NETWORK BROADCASTING SYSTEM AND METHOD OF DISTRITUTING INFORMATION FROM A MASTER CACHE TO LOCAL CACHES

Abstract Paragraph:

The comprehensive global information network broadcasting system and implementation thereof is designed to be used to provide a plurality of, what is commonly referred to as, Internet service providers with updated information through the use of high speed satellite links directly to the local Internet service provider from a centralized location. The satellite broadcasting system is combined with servers known as caching or proxy servers located at the client site which serve to store web and other data until the end user needs to access the data and a master cache center which coordinates the selection and transmission of information to those client sites via the satellite broadcasting system. The caching of data objects as close to the end user as possible will require less data to transit the backbones networks. The client site cache communicates to the master cache center via a connection to the Internet and the client site cache receives from the master cache center via the satellite broadcasting system and, in some cases, the Internet connection. Upon the receipt of a request from an Internet service provider, the information at the master cache will be transmitted from a ground station to a satellite and will be broadcast to all receiving Internet service providers using the broadcast system which overlays a capability onto the existing Internet that will allow real broadcast so that the data object can be transmitted once and received at all subscriber locations. Internet service providers will need to subscribe to the service to be able to receive these satellite transmissions, and in order to register their cache misses which is a way in which a subscriber indicates interest in a data item. A method of implementing this is disclosed using software for updating and optimizing of the local cache sites and capturing and processing the information through the receivers.

Application Filing Date:

19990315

Summary of Invention Paragraph:

[0029] Thus, the present invention provides a complete comprehensive Internet broadcasting system that employs a caching system that is positioned close to the end user while still being part of the shared infrastructure and achieving a high cache hit rate. The system further provides a complete comprehensive Internet broadcasting system which seamlessly overlays a capability on the existing Internet that may allow a real broadcast so that the data or information can be transmitted once and received at the local caching systems.

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L40: Entry 2 of 11

File: USPT

Dec 2, 2003

DOCUMENT-IDENTIFIER: US 6658462 B1

TITLE: System, method, and program for balancing cache space requirements with retrieval access time for large documents on the internet

Application Filing Date (1):  
19990826

Brief Summary Text (5):

Within the basic structure of the World Wide Web (WWW or Web), there are many Web clients that are geographically dispersed around the world. Also, there are Web servers that are dispersed around the world. Typically, a Web client makes a request to a Web server to download a document which may contain text, graphics, and/or multimedia data. The Web server receives the request and sends the document back to the Web client. The Internet typically operates over the TCP/IP protocol. Typically, it can take several seconds to transfer data over the Internet. In particular, when the transfer is across continents, the time may be in tens of seconds. In terms of computing speeds, several seconds or more is an undesirably long time. Therefore, mechanisms have evolved to store frequently accessed data closer to the client. The principle of storing frequently used data closer to the client is called caching. Caching, in general, is widely known throughout all client/server systems, including other network systems such as distributed systems, as well as to Internet specific client/server systems.

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L40: Entry 3 of 11

File: USPT

Aug 13, 2002

DOCUMENT-IDENTIFIER: US 6434609 B1

TITLE: Comprehensive global information network broadcasting system and methods of distributing information

Abstract Text (1):

The comprehensive global information network broadcasting system and implementation thereof is designed to be used to provide a plurality of, what is commonly referred to as, Internet service providers with updated information through the use of high speed satellite links directly to the local Internet service provider from a centralized location. The satellite broadcasting system is combined with servers known as caching or proxy servers located at the client site which serve to store web and other data until the end user needs to access the data and a master cache center which coordinates the selection and transmission of information to those client sites via the satellite broadcasting system. The caching of data objects as close to the end user as possible will require less data to transit the backbones networks. The client site cache communicates to the master cache center via a connection to the Internet and the client site cache receives from the master cache center via the satellite broadcasting system and, in some cases, the Internet connection. Upon the receipt of a request from an Internet service provider, the information at the master cache will be transmitted from a ground station to a satellite and will be broadcast to all receiving Internet service providers using the broadcast system which overlays a capability onto the existing Internet that will allow real broadcast so that the data object can be transmitted once and received at all subscriber locations.

Application Filing Date (1):

19990315

Brief Summary Text (31):

Thus, the present invention provides a complete comprehensive Internet broadcasting system that employs a caching system that is positioned close to the end user while still being part of the shared infrastructure and achieving a high cache hit rate. The system further provides a complete comprehensive Internet broadcasting system which seamlessly overlays a capability on the existing Internet that may allow a real broadcast so that the data or information can be transmitted once and received at the local caching systems.

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File: USPT

Jun 11, 2002

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DOCUMENT-IDENTIFIER: US 6405256 B1

TITLE: Data streaming using caching servers with expandable buffers and adjustable rate of data transmission to absorb network congestion

Application Filing Date (1):

19990331

Detailed Description Text (3):

In accordance with the principles of the present invention, FIG. 1 shows a steady-state schematic diagram of the data streaming architecture to facilitate data transmission and, in particular, efficiently stream or transfer data on a real-time basis. The illustrated system comprises a network server 100, a plurality of caching servers 108, 110, 112 and 114, which are part of a communication network 106 and a remote user client device 120. The caching servers are organized in "levels", with the caching server nearest network server 100 being level one and the caching server nearest client device 120 being the last or Nth level. The connections between the servers can be physical connections, i.e. hard-wired, or logical connections, such as an Internet connection. Furthermore, information traveling in the direction from the network server toward the client device is hereafter referred to as "downstream", while information traveling in the opposite direction is hereafter referred to as "upstream". Network server 100 has a memory 104 for storing data, and a processor 102 to facilitate transmission of data via a data streaming server application with the functionality shown in FIG. 3. The data stored in memory 104 may have an encoded video and audio data file representing a typical movie that may be transmitted via communication network 106 to remote user client device 120. Remote user client device 120, for example a personal computer, includes a buffer 124, a processor 125 with a data streaming client application and a receiver/viewer 122. Processor 125 also includes a data requesting device, which can be any conventional method of requesting data from a network server, such as using an Internet browser to click on a web page data source, an email message, and the like. The receiver/viewer 122 is any conventional video/audio playback device.

Detailed Description Text (10):

Utilization of multiple caching server levels in the communication network can be accomplished in a variety of ways. By "utilization" we mean both downstream data transfers and upstream data requests. In one method explained in conjunction with FIG. 5, client device 120 learns the location of its the nearest or upstream caching server in the communication network after making a data request to network server 100. Network server 100 redirects the client device's data request back to the client device with the location of a particular caching server 114. Caching server 114 is configured to point to another upstream caching server 112, and so on, until network server 100 is reached. For example, UUNET maintains a managed and widely deployed network, with more than 1,000 Points of Presence (POPs) around the world. The U.S. backbone network has ATM "metro rings" in 10 metropolitan multi-hub areas. These locations include Seattle, Los Angeles, Dallas, Houston, Chicago, Boston, Atlanta, New York City, Washington, D.C., and the San Francisco Bay area. Thus, caching servers may be co-located or incorporated in the hub servers of such a network and network servers could then redirect data requests to the caching server nearest to the location of the client device (e.g., New York City).

Detailed Description Text (15):

In operation, a two-phase caching technique is utilized. First, an initialization phase is used to reduce response time by accumulating data segment in caching servers nearer to the client device, thus providing a start-up sequence of data segments and second, a steady-state phase is used to continuously stream data segments to the client device.

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L40: Entry 5 of 11

File: USPT

May 14, 2002

DOCUMENT-IDENTIFIER: US 6389510 B1

TITLE: Method and apparatus for caching web-based information

Application Filing Date (1):

20000425

Detailed Description Text (12):

The caching device 106 can be located closer to the client device 102 than the server device 104. This assumption of relative location is usually accurate since there is often only a handful of server devices 104 in the world that contains a particular web object. By comparison, there are numerous caching devices 106 that may be located around the world that are situated to respond quickly to HTTP requests from a wide variety of client devices 102. For example, in a corporate environment, an object served from a caching device 106 may take less than 10 milliseconds, while the same object retrieved from a remote server device can take more than one second. Caching devices 106 can therefore provide an effective and quick alternative source of web objects for client device 102 to the server device 104, provided that the caching devices contains a significant number of web objects being sought by the client device 102.

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L40: Entry 6 of 11

File: USPT

Apr 9, 2002

DOCUMENT-IDENTIFIER: US 6370571 B1

**\*\* See image for Certificate of Correction \*\***

TITLE: System and method for delivering high-performance online multimedia services

Application Filing Date (1):  
19970305

Detailed Description Text (69):

Otherwise, if the content is not stored in the disk array 306, then the regional server 302 determines 1114 whether the backbone 102 or a RDC 118 has a direct connection via a router 130 to the remote LAN source 114. If such a direct connection exists, then the regional server 302 retrieves 1116 via the direct connection the content from the remote source 114 and stores 1118 the content in its disk array 306. The regional server 302 may then send 1110 the content to the caching server 402 nearest the requesting end-user system 124. The caching server 402 then stores 1112 the content in its cache storage 616 and sends 1106 the content to the requesting end-user system 124. This direct retrieval of the content via the router 130 more efficiently fulfills requests for content because the often unreliable and slow Internet is always bypassed.

Detailed Description Text (70):

Otherwise, if a direct connection to the remote LAN source 114 does not exist, then the regional server 302 retrieves 1122 the content from the remote source 114 via the backbone 102, the NAPs 106, and the Internet 170. The regional server 302 may then send 1110 the content to the caching server 402 nearest the requesting end-user system 124. The caching server 402 then stores 1112 the content in its cache storage 616 and sends 1106 the content to the requesting end-user system 124.

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L40: Entry 7 of 11

File: USPT

Jun 5, 2001

DOCUMENT-IDENTIFIER: US 6243760 B1

TITLE: Information dissemination system with central and distributed caches

Application Filing Date (1):  
19970624

Brief Summary Text (5):

All caching systems attempt to move content closer to the client. Two principal types of caching systems, demand and mirrored caching, are currently being deployed throughout the Internet.

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L40: Entry 8 of 11

File: USPT

Aug 29, 2000

DOCUMENT-IDENTIFIER: US 6112279 A

TITLE: Virtual web caching system

Application Filing Date (1):

19980331

Brief Summary Text (14):

The policy for placement of information for particular cache servers is cooperatively arrived within an information caching module at by the plurality of cache servers to comport with the selection module. Accordingly, for example, in the embodiment where a hash function is used to look for some site, the same hash function is used to determine which cache server is to cache information from a given site. In the embodiment where a table is used, various techniques can be employed to optimize operations, such as, for example, caching information at a server that is physically close to the community of users of the cached information.

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L40: Entry 9 of 11

File: USPT

Jul 11, 2000

DOCUMENT-IDENTIFIER: US 6088721 A

TITLE: Efficient unified replication and caching protocol

Application Filing Date (1):  
19981020

Brief Summary Text (2):

The present invention relates to the replication and caching of objects close to an end-user, in particular to a protocol for providing assurance of successful object transmissions/reception over data communication networks such as the Internet.

Brief Summary Text (7):

To attain the objective of faster response time, selected objects from a server need to be replicated in caching servers close to the end-user. Then the end-user can retrieve the objects from the nearby caching servers rather than from the original server. There must be, however, consistent and reliable replication of objects. There is therefore a need for a protocol which provides consistent replication of objects in caching servers.

Brief Summary Text (9):

An objective of the present invention is to provide replication and caching of objects close to an end-user.

Detailed Description Text (2):

In an exemplary embodiment, the present invention provides an efficient unified replication and caching protocol (EURECa). EURECa is a protocol that provides assurance of consistent replication of objects from a server to caching servers, for example, over data communication networks such as the Internet. It is an application-layer protocol which guarantees delivery of objects such as files. This protocol insures that objects sent by a source machine such as a server to any number of destination machines such as caching servers actually arrive at the intended caching servers even when the caching servers are temporarily unavailable, for example, due to failure or network partition or because they crashed. EURECa provides efficient mechanisms for selective replication and caching of objects, such as web contents, close to a user. In an exemplary embodiment of the present invention as shown in FIG. 2, EURECa may be a key middleware component residing on top of a transport-layer protocol such as Transmission Control Protocol (TCP), User Data Protocol (UDP) and Reliable Multicast Transport Protocol (RMTP), all of which reside on top of the Internet Protocol (IP). EURECa may be implemented, for example, on the server and caching servers from which users are expected to retrieve objects as shown in FIG. 1. In one embodiment, for example, EURECa may be implemented directly on real servers and caching servers of the server vendors or on the servers and caching servers provided by a third party while interfacing with the real servers through an Application Programmers' Interface (API).

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L40: Entry 11 of 11

File: USPT

Nov 16, 1999

DOCUMENT-IDENTIFIER: US 5987233 A

TITLE: Comprehensive global information network broadcasting system and implementation thereof

Abstract Text (1):

The comprehensive global information network broadcasting system and implementation thereof is designed to be used to provide a plurality of, what is commonly referred to as internet service providers with updated information through the use of high speed satellite links directly to the local internet service provider from a centralized location. The satellite broadcasting system is combined with servers known as caching or proxy servers located at the client site which serve to store web and other data until the end user needs to access the data and a master cache center which coordinates the selection and transmission of information to those client sites via the satellite broadcasting system. The caching of data objects as close to the end user as possible will require less data to transit the backbones networks. The client site cache communicates to the master cache center via a connection to the internet and the client site cache receives from the master cache center via the satellite broadcasting system and, in some cases, the internet connection.

Application Filing Date (1):

19980316

Brief Summary Text (9):

What is needed is a complete comprehensive internet broadcasting system that will use a caching system that is positioned as close as possible to the end user while still being part of the shared infrastructure, because a cache at the end users location can only serve that end user and it is desirable and necessary for efficient and effective use that the cache server be shared by multiple users which will require less data and information to transit across the point to point network. What is also needed is a complete comprehensive internet broadcasting system which will overlay a capability on the existing internet that will allow a real broadcast so that the data or information can be transmitted once and received at all local caching systems.

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L41: Entry 4 of 4

File: USPT

Apr 11, 2000

DOCUMENT-IDENTIFIER: US 6049829 A

TITLE: Information access system and method

Application Filing Date (1):19970722Brief Summary Text (10):

In the invention, information is categorized, stored and distributed according to the "closeness" to the client in an EP sense, and the nature of the information. The information is broken into a hierarchy of types, illustratively at least three classes. The type of information that is closest in an EP sense to users are information elements, referred to as "infoids" herein, on a specially-provided Information Carousel. Those infoids are constantly broadcast through one or more physical channels to all the information clients on a shared network system. The Information Carousel automatically distributes infoids of an infoid package in rotation to be picked up by any information client on the system without explicit client request, as long as that client has the proper decoding information for the physical channel over which that Information Carousel stream is carried. There may be more than one Information Carousel on an access network. In addition to infoids that are grouped together in packages, an Information Carousel can also carry information from a next-category Local Content Server if it meets certain access criteria, for example, client access frequency rising above a threshold. The infoids can also be moved from an Information Carousel to a Local Content Server when they meet some conditions, for example, timer expiration.

Brief Summary Text (11):

Local Content (LC) is the type of information second closest to clients in the invention. LC is stored on local server(s), and unlike infoids can be accessed upon client request. In addition to content that is designated as local and stored in an LC server until further notice, a LC server can also carry information content from a Remote Content Server if it meets certain access criteria, for example, client access frequency. Local Content can also be removed from an LC server when it meets some conditions, for example, that the content has become stale as indicated by timer expiration, or when access frequency by clients decreases below a threshold.

Brief Summary Text (12):

Lastly, in the third illustrative category Remote Content (RC) refers to all other information that is stored remotely on the World Wide Web, and can be accessed through the regular manner of Web browsing. If a piece of information is accessed frequently enough or has just been accessed, it can also be copied and moved to an LC server closer to the client, a process that is commonly referred to as "caching".

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L41: Entry 2 of 4

File: USPT

Aug 13, 2002

DOCUMENT-IDENTIFIER: US 6434609 B1

TITLE: Comprehensive global information network broadcasting system and methods of distributing information

Abstract Text (1):

The comprehensive global information network broadcasting system and implementation thereof is designed to be used to provide a plurality of, what is commonly referred to as, Internet service providers with updated information through the use of high speed satellite links directly to the local Internet service provider from a centralized location. The satellite broadcasting system is combined with servers known as caching or proxy servers located at the client site which serve to store web and other data until the end user needs to access the data and a master cache center which coordinates the selection and transmission of information to those client sites via the satellite broadcasting system. The caching of data objects as close to the end user as possible will require less data to transit the backbone networks. The client site cache communicates to the master cache center via a connection to the Internet and the client site cache receives from the master cache center via the satellite broadcasting system and, in some cases, the Internet connection. Upon the receipt of a request from an Internet service provider, the information at the master cache will be transmitted from a ground station to a satellite and will be broadcast to all receiving Internet service providers using the broadcast system which overlays a capability onto the existing Internet that will allow real broadcast so that the data object can be transmitted once and received at all subscriber locations.

Application Filing Date (1):

19990315

Brief Summary Text (20):

Another object of the present invention is the extrapolation of a statistically relevant sample from a list of requests for information that may modify a threshold of interest parameter for the selection of information into a local cache.

Brief Summary Text (21):

Another object of the present invention is to modify a threshold of interest in the selection of data of interest for input into a local cache based at least in part on historical interest in local demand for said data over a predetermined window of time.

Brief Summary Text (31):

Thus, the present invention provides a complete comprehensive Internet broadcasting system that employs a caching system that is positioned close to the end user while still being part of the shared infrastructure and achieving a high cache hit rate. The system further provides a complete comprehensive Internet broadcasting system which seamlessly overlays a capability on the existing Internet that may allow a real broadcast so that the data or information can be transmitted once and received at the local caching systems.

Detailed Description Text (13):

Once the system receives the cache miss information 100 the system may store the

miss information in a volatile or non-volatile storage device 104. This may provide a non-volatile storage record for the threshold calculations described below.

Detailed Description Text (14):

The first threshold of interest factor that may be employed by the present invention is determining whether requests for information exceed a predetermined rate 106. The rate of request for information can be determined by collecting information as to the time at which the request for information was received by the system. When the rate of requests for information exceeds a predetermined number over a predetermined time, for example 10 minutes, the system may designate the information for broadcast 120. If the rate of the requests for information does not exceed the predetermined threshold, the system may pass the request for information to the next rule 114.

Detailed Description Text (15):

The next rule the system may use to determine whether to broadcast the information to the subscriber caches is to determine whether the request for information exceeds a global demand threshold 108. In this rule, the system may determine whether the request for information exceeds a predetermined number for overall demand. This parameter may identify web pages that provide a consistent long term level of interest. If the request for information exceeds this threshold, then the information is designated for broadcast to the subscriber caches 122. If the request for information does not exceed this predetermined threshold then the system may pass the request for information to the next rule.

Detailed Description Text (16):

The next rule determines whether to designate the information for broadcast to a local cache based on localized demand for the information. It is within the scope of the present invention to store cache miss information that identifies which subscriber cache is reporting the cache miss information. The system may then use a predetermined threshold for localized demand. For example, from the rules described above, which are herein incorporated by reference, to designate whether the information should be broadcast to a local subscriber cache 124. Thus, it is within the scope of the present invention to update a local subscriber cache by uniquely addressing a local cache adapter for the broadcast cache update. In a first unique addressing mode, a conventional satellite receiver may be addressed to receive a unique satellite broadcast. In a second unique addressing mode, the present invention may address the cache adapter through conventional protocol addressing techniques. If the local information threshold rule 110 is not exceeded, then the system may pass the information request to the next exemplary rule 118.

CLAIMS:

1. An information distribution method in a master caching system, comprising: receiving information from one or more local caching systems, said received information reflecting user interest in information content; inferring, based at least in part on said received information, a level of interest by users served by a local caching system beyond said one or more local caching systems; retrieving said information content; and distributing said information content to said second local caching system via a satellite broadcast linking system when said level of interest has reached a threshold level.
3. The method of claim 2, wherein said retrieving occurs prior to said level of interest reaching said threshold level.
4. The method of claim 2, wherein said retrieving occurs after said level of interest reaches said threshold level.
6. The method of claim 1, wherein said threshold level is a predetermined level.

8. An information distribution method in a master caching system, comprising: receiving, from one or more local caching systems, messages indicative of user interest in information content at said one or more local caching systems; determining a level of user interest based on said received messages; and distributing said information content via a satellite broadcast linking system to at least one local caching system beyond said one or more local caching systems when said determined level of user interest has reached a threshold level.

9. The method of claim 8, further comprising retrieving said information content via the Internet after said determined level of user interest has reached a threshold level.

10. The method of claim 8, further comprising retrieving said information content via the Internet before said determined level of user interest has reached a threshold level.

12. The method of claim 8, wherein said threshold level is a predetermined level.

13. A caching system, comprising: a satellite broadcast system; and a master cache connected to a plurality of local caches, each of said plurality of local caches being connected to a respective plurality of users, said master cache being operative to receive a communication from a first local cache regarding a cache miss, retrieving information content referenced by said communication from said first local cache, and distributing said retrieved information content to a remaining plurality of local caches via said satellite broadcast system upon a determination that a level of interest in said information content has reached a threshold level.

18. A network caching method, comprising: receiving cache miss information from a first local cache at a master cache; determining, at said master cache, a level of user interest based on said received cache miss information; and retrieving, in response to said received cache miss information, information content identified in said cache miss information from the Internet; storing said retrieved information content in said master cache; and transmitting said retrieved information content from said master cache to a plurality of local caches beyond said first local cache when said determined level of user interest has reached a threshold level.

21. A network caching method, comprising: receiving, from a master cache via a satellite broadcast system, information content for storage at a local cache of a first internet service provider, said information content being forwarded by said master cache when a level of interest in said information content, as determined by said master cache, has reached a threshold level, said forwarding occurring prior to a request for said information content by said local cache.

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L41: Entry 1 of 4

File: PGPB

Sep 12, 2002

DOCUMENT-IDENTIFIER: US 20020129116 A1

TITLE: NETWORK BROADCASTING SYSTEM AND METHOD OF DISTRITUTING INFORMATION FROM A MASTER CACHE TO LOCAL CACHES

Abstract Paragraph:

The comprehensive global information network broadcasting system and implementation thereof is designed to be used to provide a plurality of, what is commonly referred to as, Internet service providers with updated information through the use of high speed satellite links directly to the local Internet service provider from a centralized location. The satellite broadcasting system is combined with servers known as caching or proxy servers located at the client site which serve to store web and other data until the end user needs to access the data and a master cache center which coordinates the selection and transmission of information to those client sites via the satellite broadcasting system. The caching of data objects as close to the end user as possible will require less data to transit the backbones networks. The client site cache communicates to the master cache center via a connection to the Internet and the client site cache receives from the master cache center via the satellite broadcasting system and, in some cases, the Internet connection. Upon the receipt of a request from an Internet service provider, the information at the master cache will be transmitted from a ground station to a satellite and will be broadcast to all receiving Internet service providers using the broadcast system which overlays a capability onto the existing Internet that will allow real broadcast so that the data object can be transmitted once and received at all subscriber locations. Internet service providers will need to subscribe to the service to be able to receive these satellite transmissions, and in order to register their cache misses which is a way in which a subscriber indicates interest in a data item. A method of implementing this is disclosed using software for updating and optimizing of the local cache sites and capturing and processing the information through the receivers.

Application Filing Date:

19990315

Summary of Invention Paragraph:

[0018] Another object of the present invention is the extrapolation of a statistically relevant sample from a list of requests for information that may modify a threshold of interest parameter for the selection of information into a local cache.

Summary of Invention Paragraph:

[0019] Another object of the present invention is to modify a threshold of interest in the selection of data of interest for input into a local cache based at least in part on historical interest in local demand for said data over a predetermined window of time.

Summary of Invention Paragraph:

[0029] Thus, the present invention provides a complete comprehensive Internet broadcasting system that employs a caching system that is positioned close to the end user while still being part of the shared infrastructure and achieving a high cache hit rate. The system further provides a complete comprehensive Internet

broadcasting system which seamlessly overlays a capability on the existing Internet that may allow a real broadcast so that the data or information can be transmitted once and received at the local caching systems.

Detail Description Paragraph:

[0051] Once the system receives the cache miss information 100 the system may store the miss information in a volatile or non-volatile storage device 104. This may provide a non-volatile storage record for the threshold calculations described below.

Detail Description Paragraph:

[0052] The first threshold of interest factor that may be employed by the present invention is determining whether requests for information exceed a predetermined rate 106. The rate of request for information can be determined by collecting information as to the time at which the request for information was received by the system. When the rate of requests for information exceeds a predetermined number over a predetermined time, for example 10 minutes, the system may designate the information for broadcast 120. If the rate of the requests for information does not exceed the predetermined threshold, the system may pass the request for information to the next rule 114.

Detail Description Paragraph:

[0053] The next rule the system may use to determine whether to broadcast the information to the subscriber caches is to determine whether the request for information exceeds a global demand threshold 108. In this rule, the system may determine whether the request for information exceeds a predetermined number for overall demand. This parameter may identify web pages that provide a consistent long term level of interest. If the request for information exceeds this threshold, then the information is designated for broadcast to the subscriber caches 122. If the request for information does not exceed this predetermined threshold then the system may pass the request for information to the next rule.

Detail Description Paragraph:

[0054] The next rule determines whether to designate the information for broadcast to a local cache based on localized demand for the information. It is within the scope of the present invention to store cache miss information that identifies which subscriber cache is reporting the cache miss information. The system may then use a predetermined threshold for localized demand. For example, from the rules described above, which are herein incorporated by reference, to designate whether the information should be broadcast to a local subscriber cache 124. Thus, it is within the scope of the present invention to update a local subscriber cache by uniquely addressing a local cache adapter for the broadcast cache update. In a first unique addressing mode, a conventional satellite receiver may be addressed to receive a unique satellite broadcast. In a second unique addressing mode, the present invention may address the cache adapter through conventional protocol addressing techniques. If the local information threshold rule 110 is not exceeded, then the system may pass the information request to the next exemplary rule 118.

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L22: Entry 3 of 3

File: USPT

Nov 2, 1999

DOCUMENT-IDENTIFIER: US 5978381 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Transmitting high bandwidth network content on a low bandwidth communications channel during off peak hours

Application Filing Date (1):  
19970606

## CLAIMS:

1. In a computer network that includes (i) a plurality of remote servers for accessing a plurality of network sites containing various types of content that can be viewed and downloaded, (ii) a plurality of proxy servers for caching content from frequently accessed sites of one or more of the remote servers, and (iii) a plurality of client systems each having a caching store to which requested content of one or more sites on the network can be downloaded from any of the remote or proxy servers, and wherein each of the remote servers, proxy servers and client systems are logically connected to one another over a plurality of communications channels, at least some of which are low bandwidth communication channels, a method of improving transmission of network content by utilizing off peak as opposed to peak time periods for downloading selected content, comprising the steps of:

tracking at the client system on-line usage of a user in the form of information that corresponds to one or more sites and/or the content contained at such sites accessed by the user;

during an off peak time period, the client system automatically and without user intervention, connecting to at least one of said remote or proxy servers, and authenticating to the connected server the client system that is connecting;

thereafter, during the off peak time period, downloading from the connected server content from one or more sites on the network as identified from the information tracked at the client system; and

storing the downloaded content in the caching store of the client system, and then disconnecting the client system prior to return of the peak time period.

8. The method according to claim 7 further including the steps of:

said plurality of client systems assessing individual user profiles and previously downloaded data; and

generating said requests based on the assessed individual user profiles and previously downloaded data.

11. In a computer network that includes (i) a plurality of remote servers for accessing a plurality of network sites containing various types of content that can be viewed and downloaded, (ii) a plurality of proxy servers for caching content from frequently accessed sites of one or more of the remote servers, and (iii) a



plurality of client systems each having a caching store to which requested content of one or more sites on the network can be downloaded from any of the remote or proxy servers, and wherein each of the remote servers, proxy servers and client systems are logically connected to one another over a plurality of communications channels, at least some of which are low bandwidth communication channels, as an article of manufacture, computer program product for utilization on a client system in order to implement a method of improving transmission of network content by utilizing off peak as opposed to peak time periods for downloading selected content, said computer program product comprising:

computer readable medium for containing computer program code means; and

wherein the computer program code means comprise instructions for operating a client system in accordance with a method which is comprised of the steps of:

tracking at the client system on-line usage of a user in the form of information that corresponds to one or more sites and/or the content contained at such sites accessed by the user;

during an off peak time period, the client system automatically and without user intervention, connecting to at least one of said remote or proxy servers, and authenticating to the connected server the client system that is connecting;

thereafter, during the off peak time period, downloading from the connected server content from one or more sites on the network as identified from the information tracked at the client system; and

storing the downloaded content in the caching store of the client system, and then disconnecting the client system prior to return of the peak time period.

18. The method as implemented by the computer program product according to claim 17 further including the steps of:

said plurality of client systems assessing individual user profiles and previously downloaded data; and

generating said requests based on the assessed individual user profiles and previously downloaded data.

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L22: Entry 2 of 3

File: USPT

Jun 6, 2000

DOCUMENT-IDENTIFIER: US 6073168 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Method for reducing delivery latency of an image or other secondary information associated with a file

Application Filing Date (1):  
19970120

Detailed Description Text (105):

The user database 66 of the present invention stores various information pertaining to each authorized user of a client 1. This information includes account information, a list of the WebTV.TM. that services are available to the particular user, and certain user preferences. For example, a particular user may not wish his client 1 to be used to access Web pages having adult-oriented subject matter. Consequently, the user would request that his account be filtered to prevent access to such material. This request would then be stored as part of the user data in the user database 66.

Detailed Description Text (106):

With regard to user preferences, the hypertext links selected by a given user can be tracked, and those having the largest number can be stored in the user database 66. The list can then be provided to the client 1 for use in generating a menu screen of the user's favorite Web sites, to allow the user to directly access those Web sites. The list can also be used by the server 5 to analyze the user's interests and to formulate and provide to the user a list of new Web sites which the user is likely to be interested in. The list might be composed by associated key words in Web pages selected by the user with other Web pages.

CLAIMS:

1. A method for reducing delivery latency in a computer network when downloading electronic documents to a client system from a proxy server, the computer network including (i) a plurality of remote servers for accessing a plurality of network sites containing various types of content that can be viewed and downloaded, the network sites including electronic documents that contain both images and text for downloading, (ii) at least one proxy server for caching content from frequently accessed sites of one or more of the remote servers, and (iii) a plurality of client systems to which one or more such electronic documents are to be downloaded for display, wherein the method comprises the steps of:

storing at the proxy server a document database for electronic documents previously requested by client systems, said database including information about the requested documents to facilitate transcoding and downloading of a document when requested by a client system, said information including information as to whether a document includes an image in addition to text, and if so, an indication as to the physical size of the image;

receiving at the proxy server a request from a client system for a document;

determining at the proxy server whether the requested document is referenced in said document database, and if not adding to the document database the information for that document after the document has been retrieved from a remote server; and

if the requested document is referenced in said document database, initially downloading to the client system the requested document by leaving a blank area in the downloaded document that corresponds to the image so that the text of the requested document can be viewed at the client system while the image is retrieved from a remote server and then subsequently downloaded to the client system.

5. A computer readable medium for use in a computer network that includes (i) a plurality of remote servers for accessing a plurality of network sites containing various types of content that can be viewed and downloaded including electronic documents that contain both images and text for downloading, (ii) at least one proxy server for caching content from frequently accessed sites of one or more of the remote servers, and (iii) a plurality of client systems to which one or more such electronic documents are to be downloaded for display, wherein the computer readable medium carries computer executable instructions for implementing in said computer network a method for reducing delivery latency when downloading such electronic documents to a client system from said proxy server, wherein the computer readable medium carries the following:

computer executable instructions for performing a step for storing at the proxy server a document database for electronic documents previously requested by client systems, said database including information about the requested documents to facilitate transcoding and downloading of a document when requested by a client system, said information including information as to whether a document includes an image in addition to text, and if so, an indication as to the physical size of the in-line image;

computer executable instructions for performing a step for receiving at the proxy server a request from a client system for a document;

computer executable instructions for performing a step for determining at the proxy server whether the requested document is referenced in said document database, and if not adding to the document database the information for that document after the document has been retrieved from a remote server; and

computer executable instructions for performing a step for if the requested document is referenced in said document database, initially downloading to the client system the requested document by leaving a blank area in the downloaded document that corresponds to the image so that the text of the requested document can be viewed at the client system while the image is retrieved from a remote server and then subsequently downloaded to the client system.

8. A method for reducing delivery latency in a computer network when downloading electronic documents to a client system from a proxy server, the computer network including (i) a plurality of remote servers for accessing a plurality of network sites containing various types of content that can be viewed and downloaded including electronic documents that contain both images and text for downloading, (ii) at least one proxy server for caching content from frequently accessed sites of one or more of the remote servers, and (iii) a plurality of client systems to which one or more such electronic documents are to be downloaded for display, wherein the method comprises the following:

a specific act of the proxy server storing a document database for electronic documents previously requested by client systems, said database including information as to whether a document includes an image in addition to text, and if so, an indication as to the physical size of the image;

a specific act of receiving at the proxy server a request from a client system for a document that includes an image;

a specific act of the proxy server determining whether the requested document is referenced in said document database;

a specific act of if the requested document is referenced in said document database, the proxy server initially downloading the requested document to the client system so as to allow the client system to display the requested document with a blank area in the downloaded document sized and positioned to correspond to the image;

a specific act of the proxy server retrieving the image from a remote server while the requested document is being downloaded to the client system; and

a specific act of the proxy server downloading the image to the client system once the proxy server has retrieved the image from the remote server.

12. A computer readable medium for use in a computer network that includes (i) a plurality of remote servers for accessing a plurality of network sites containing various types of content that can be viewed and downloaded including electronic documents that contain both images and text for downloading, (ii) at least one proxy server for caching content from frequently accessed sites of one or more of the remote servers, and (iii) a plurality of client systems to which one or more such electronic documents are to be downloaded for display, wherein the computer readable medium includes the following:

computer executable instructions for performing a specific act of the proxy server storing a document database for electronic documents previously requested by client systems, said database including information as to whether a document includes an image in addition to text, and if so, an indication as to the physical size of the image;

computer executable instructions for performing a specific act of receiving at the proxy server a request from a client system for a document that includes an image;

computer executable instructions for performing a specific act of the proxy server determining whether the requested document is referenced in said document database;

computer executable instructions for performing a specific act of if the requested document is referenced in said document database, the proxy server initially downloading the requested document to the client system so as to allow the client system to display the requested document with a blank area in the downloaded document sized and positioned to correspond to the image;

computer executable instructions for performing a specific act of the proxy server retrieving the image from a remote server while the requested document is being downloaded to the client system; and

computer executable instructions for performing a specific act of the proxy server downloading the image to the client system once the proxy server has retrieved the image from the remote server.

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Generate Collection

L18: Entry 17 of 33

File: USPT

Jun 6, 2000

DOCUMENT-IDENTIFIER: US 6073168 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Method for reducing delivery latency of an image or other secondary information associated with a file

Application Filing Date (1):  
19970120

CLAIMS:

1. A method for reducing delivery latency in a computer network when downloading electronic documents to a client system from a proxy server, the computer network including (i) a plurality of remote servers for accessing a plurality of network sites containing various types of content that can be viewed and downloaded, the network sites including electronic documents that contain both images and text for downloading, (ii) at least one proxy server for caching content from frequently accessed sites of one or more of the remote servers, and (iii) a plurality of client systems to which one or more such electronic documents are to be downloaded for display, wherein the method comprises the steps of:

storing at the proxy server a document database for electronic documents previously requested by client systems, said database including information about the requested documents to facilitate transcoding and downloading of a document when requested by a client system, said information including information as to whether a document includes an image in addition to text, and if so, an indication as to the physical size of the image;

receiving at the proxy server a request from a client system for a document;

determining at the proxy server whether the requested document is referenced in said document database, and if not adding to the document database the information for that document after the document has been retrieved from a remote server; and

if the requested document is referenced in said document database, initially downloading to the client system the requested document by leaving a blank area in the downloaded document that corresponds to the image so that the text of the requested document can be viewed at the client system while the image is retrieved from a remote server and then subsequently downloaded to the client system.

5. A computer readable medium for use in a computer network that includes (i) a plurality of remote servers for accessing a plurality of network sites containing various types of content that can be viewed and downloaded including electronic documents that contain both images and text for downloading, (ii) at least one proxy server for caching content from frequently accessed sites of one or more of the remote servers, and (iii) a plurality of client systems to which one or more such electronic documents are to be downloaded for display, wherein the computer readable medium carries computer executable instructions for implementing in said computer network a method for reducing delivery latency when downloading such electronic documents to a client system from said proxy server, wherein the

computer readable medium carries the following:

computer executable instructions for performing a step for storing at the proxy server a document database for electronic documents previously requested by client systems, said database including information about the requested documents to facilitate transcoding and downloading of a document when requested by a client system, said information including information as to whether a document includes an image in addition to text, and if so, an indication as to the physical size of the in-line image;

computer executable instructions for performing a step for receiving at the proxy server a request from a client system for a document;

computer executable instructions for performing a step for determining at the proxy server whether the requested document is referenced in said document database, and if not adding to the document database the information for that document after the document has been retrieved from a remote server; and

computer executable instructions for performing a step for if the requested document is referenced in said document database, initially downloading to the client system the requested document by leaving a blank area in the downloaded document that corresponds to the image so that the text of the requested document can be viewed at the client system while the image is retrieved from a remote server and then subsequently downloaded to the client system.

8. A method for reducing delivery latency in a computer network when downloading electronic documents to a client system from a proxy server, the computer network including (i) a plurality of remote servers for accessing a plurality of network sites containing various types of content that can be viewed and downloaded including electronic documents that contain both images and text for downloading, (ii) at least one proxy server for caching content from frequently accessed sites of one or more of the remote servers, and (iii) a plurality of client systems to which one or more such electronic documents are to be downloaded for display, wherein the method comprises the following:

a specific act of the proxy server storing a document database for electronic documents previously requested by client systems, said database including information as to whether a document includes an image in addition to text, and if so, an indication as to the physical size of the image;

a specific act of receiving at the proxy server a request from a client system for a document that includes an image;

a specific act of the proxy server determining whether the requested document is referenced in said document database;

a specific act of if the requested document is referenced in said document database, the proxy server initially downloading the requested document to the client system so as to allow the client system to display the requested document with a blank area in the downloaded document sized and positioned to correspond to the image;

a specific act of the proxy server retrieving the image from a remote server while the requested document is being downloaded to the client system; and

a specific act of the proxy server downloading the image to the client system once the proxy server has retrieved the image from the remote server.

12. A computer readable medium for use in a computer network that includes (i) a plurality of remote servers for accessing a plurality of network sites containing

various types of content that can be viewed and downloaded including electronic documents that contain both images and text for downloading, (ii) at least one proxy server for caching content from frequently accessed sites of one or more of the remote servers, and (iii) a plurality of client systems to which one or more such electronic documents are to be downloaded for display, wherein the computer readable medium includes the following:

computer executable instructions for performing a specific act of the proxy server storing a document database for electronic documents previously requested by client systems, said database including information as to whether a document includes an image in addition to text, and if so, an indication as to the physical size of the image;

computer executable instructions for performing a specific act of receiving at the proxy server a request from a client system for a document that includes an image;

computer executable instructions for performing a specific act of the proxy server determining whether the requested document is referenced in said document database;

computer executable instructions for performing a specific act of if the requested document is referenced in said document database, the proxy server initially downloading the requested document to the client system so as to allow the client system to display the requested document with a blank area in the downloaded document sized and positioned to correspond to the image;

computer executable instructions for performing a specific act of the proxy server retrieving the image from a remote server while the requested document is being downloaded to the client system; and

computer executable instructions for performing a specific act of the proxy server downloading the image to the client system once the proxy server has retrieved the image from the remote server.

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L38: Entry 5 of 5

File: USPT

Aug 14, 2001

DOCUMENT-IDENTIFIER: US 6275496 B1

**\*\* See image for Certificate of Correction \*\***

TITLE: Content provider for pull based intelligent caching system

Abstract Text (1):

A network system includes a content provider connected to local service providers via an interactive distribution network, such as the Internet. The local service providers facilitate delivery of the content from the content provider to multiple subscribers. The local service providers schedule delivery of frequently requested content from the content provider prior to a peak time when the subscribers are likely to request the content. The content is downloaded from the content provider during the off-peak hours and cached at the local service providers for serving to the subscribers during the ensuing peak time. In this manner, the frequently requested content is already present at the local service providers and ready to be served to the subscribers before they actually request it. When the content is finally requested, the data is streamed continuously in real-time for just-in-time rendering at the subscriber computer. Another aspect of this invention involves supplementing content delivery over the Internet with delivery of content over a secondary network, such as a broadcast satellite network. The supplemental broadcast link offers additional bandwidth at a fraction of the cost that would be incurred if the local service provider installed additional Internet connections, such as T1 or T3 connections.

Application Filing Date (1):  
19990302

Brief Summary Text (22):

This invention provides improved methods for delivering large amounts of data, such as streaming audio and video data, over a network, such as the Internet. According to one aspect, the method involves an intelligent, pre-caching and pre-loading of frequently requested content to the local service provider (e.g., ISP or LAN network server) prior to peak demand times when the content is likely to be requested by the subscribers. In this manner, the frequently requested content is already downloaded and ready to be served to the subscribers before they actually request it. When the content is finally requested, the data is streamed continuously in real-time for just-in-time rendering at the subscriber. This eliminates the latency problems of prior art systems because the subscribers do not have to wait for the downloading of video and audio files over the Internet. Moreover, intelligently pre-caching content before peak demand times is more effective than traditional on-demand caching because the content is available to the first subscriber who requests it.

Brief Summary Text (24):

The local service provider includes a processing control unit, a cache memory, and a continuous media server. A hit recording module executes on the processing control unit to record requests for particular content from the subscribers. In the Internet context these requests are submitted in the form of URLs (universal resource locators) for target resources located on the Web. A pattern recognizer detects behavior patterns based on subscriber requests to determine which content



the subscribers are most likely to request and when. A scheduler then schedules requests for the frequently requested content from the content provider at a selected time prior to the peak demand time for that content. These requests are posted to the content provider at their scheduled times, and the content provider downloads the content during the off-hours prior to the peak time.

Brief Summary Text (25):

When the content is received from the content provider, the local service provider stores the content in the cache memory. For instance, the content might be a Web page from a frequently visited Web site. Web pages are typically designed as hypermedia documents to provide rich multimedia presentations which blend text, images, sound, and video. If the Web page references or includes continuous data files, such as audio or video files, these files are stored in a continuous media server. The target specifications embedded in the Web page to reference the continuous data files are modified to reference the local copy of the continuous data files, as opposed to the original location of the files at the Web site.

Detailed Description Text (11):

As explained in the Background section, conventional techniques for delivering video and audio content over the Internet is plagued with latency problems. An aspect of this invention is to provide an improved method for delivering streaming audio and video content over a network system. The technique involves an intelligent, pre-caching and pre-loading of certain content at the local service provider (e.g., ISP, POP, LAN network server) prior to optimal or peak demand times when the content is likely to be requested by the subscribers. In this manner, the frequently requested content is already downloaded and ready for access from the subscribers before they actually request it. When it is finally requested, the data can be streamed continuously in real-time for just-in-time rendering from the local service provider to the subscriber. This eliminates the latency problems of prior art systems. Moreover, intelligently pre-caching content before peak demand times is more effective than traditional on-demand caching because the content is available to the first subscriber who requests it.

Detailed Description Text (18):

The pattern recognizer 116 and scheduler 118 cooperate to enable intelligent pre-caching of frequently requested content. The operation of the local service provider 110 to perform this intelligent pre-caching according to an aspect of this invention is described in conjunction with reference to the flow diagram of FIG. 5. The local service provider is programmed to perform the computer-implemented steps of FIG. 5 to alleviate the problems of providing streaming video and audio data over the Internet. The steps are presented in the illustrated order for discussion purposes, but are not restricted to this sequence.

Detailed Description Text (19):

The pattern recognizer 116 monitors the patterns of the subscriber requests to determine which content is most frequently requested and when (step 150 in FIG. 5). From these patterns, the pattern recognizer 116 can identify peak times in subscriber traffic and the relation of the peak times to specific requested content (step 152). For instance, suppose that a high number of subscribers frequently request the CNN Web page during the morning hours of 6:30 AM to 8:00 AM. These requests translate into a high number of URL hits for the CNN Web page which are recorded by hit recorder 112 in the URL hit database 114. The pattern recognizer 116 recognizes this recurring pattern of requests for the CNN Web page and identifies the peak time for this Web page to be between 6:30 AM and 8:00 AM.

Detailed Description Text (30):

Deletion policies are a function of the content itself (e.g., its TTL tags), the subscriber patterns (e.g., how frequently the content is requested), the cost to request newer updated content, and the constraints imposed by capacity limitations of the cache memory.

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L18: Entry 18 of 33

File: USPT

Nov 2, 1999

DOCUMENT-IDENTIFIER: US 5978381 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Transmitting high bandwidth network content on a low bandwidth communications channel during off peak hours

Application Filing Date (1):19970606

## CLAIMS:

1. In a computer network that includes (i) a plurality of remote servers for accessing a plurality of network sites containing various types of content that can be viewed and downloaded, (ii) a plurality of proxy servers for caching content from frequently accessed sites of one or more of the remote servers, and (iii) a plurality of client systems each having a caching store to which requested content of one or more sites on the network can be downloaded from any of the remote or proxy servers, and wherein each of the remote servers, proxy servers and client systems are logically connected to one another over a plurality of communications channels, at least some of which are low bandwidth communication channels, a method of improving transmission of network content by utilizing off peak as opposed to peak time periods for downloading selected content, comprising the steps of:

tracking at the client system on-line usage of a user in the form of information that corresponds to one or more sites and/or the content contained at such sites accessed by the user;

during an off peak time period, the client system automatically and without user intervention, connecting to at least one of said remote or proxy servers, and authenticating to the connected server the client system that is connecting;

thereafter, during the off peak time period, downloading from the connected server content from one or more sites on the network as identified from the information tracked at the client system; and

storing the downloaded content in the caching store of the client system, and then disconnecting the client system prior to return of the peak time period.

11. In a computer network that includes (i) a plurality of remote servers for accessing a plurality of network sites containing various types of content that can be viewed and downloaded, (ii) a plurality of proxy servers for caching content from frequently accessed sites of one or more of the remote servers, and (iii) a plurality of client systems each having a caching store to which requested content of one or more sites on the network can be downloaded from any of the remote or proxy servers, and wherein each of the remote servers, proxy servers and client systems are logically connected to one another over a plurality of communications channels, at least some of which are low bandwidth communication channels, as an article of manufacture, computer program product for utilization on a client system in order to implement a method of improving transmission of network content by utilizing off peak as opposed to peak time periods for downloading selected

content, said computer program product comprising:

computer readable medium for containing computer program code means; and

wherein the computer program code means comprise instructions for operating a client system in accordance with a method which is comprised of the steps of:

tracking at the client system on-line usage of a user in the form of information that corresponds to one or more sites and/or the content contained at such sites accessed by the user;

during an off peak time period, the client system automatically and without user intervention, connecting to at least one of said remote or proxy servers, and authenticating to the connected server the client system that is connecting;

thereafter, during the off peak time period, downloading from the connected server content from one or more sites on the network as identified from the information tracked at the client system; and

storing the downloaded content in the caching store of the client system, and then disconnecting the client system prior to return of the peak time period.

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L18: Entry 16 of 33

File: USPT

Jan 9, 2001

DOCUMENT-IDENTIFIER: US 6173322 B1

TITLE: Network request distribution based on static rules and dynamic performance data

Application Filing Date (1):19970605Detailed Description Text (18):

Second, connection cache 214 selectively stores connections established with content servers 106, again according to conventional caching techniques. Connection module 208 checks connection cache 214 before establishing a new connection with a selected content server. Connection cache 214 may therefore dispense with the need for re-establishing connections with frequently accessed content servers.

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L45: Entry 1 of 18

File: PGPB

Oct 28, 2004

DOCUMENT-IDENTIFIER: US 20040215770 A1

TITLE: Device for enabling trap and trace of internet protocol communications

Detail Description Paragraph:

[0019] Access network 12, an example of which would be an Internet Service Providers (ISPs) or Local Exchange Carriers (LECs), is used to provide both data and voice access over the public IP network. Access network 12 can provide services for enterprises through enterprise routers 16, for example company networks such as the company network for Lucent Technologies or Merrill Lynch, or for individual homes, home offices, or small businesses through dial-up or high speed connections such as digital subscriber lines (DSL) which connect through aggregation devices such as DSLAM 14.

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